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HcDD: The Hybrid Combination of Disk Drives in Active Storage Systems

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Abstract : Since large-scale and data-intensive applications have been widely deployed, there is a growing demand for high-performance storage systems to support data-intensive applications. Compared with traditional storage systems, next-generation systems will embrace dedicated processor to reduce computational load of host machines and will have hybrid combinations of different storage devices. The advent of flash- memory-based solid state disk has become a critical role in revolutionizing the storage world. However, instead of simply replacing the traditional magnetic hard disk with the solid state disk, it is believed that finding a complementary approach to corporate both of them is more challenging and attractive. This paper explores an idea of active storage, an emerging new storage configuration, in terms of the architecture and design, the parallel processing capability, the cooperation of other machines in cluster computing environment, and a disk configuration, the hybrid combination of different types of disk drives. Experimental results indicate that the proposed HcDD achieves better I/O performance and longer storage system lifespan.

Keywords : arallel storage system, hybrid storage system, data inten- sive, solid state disks, reliability
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